

## CLAIMS

What is claimed is:

- 5        1. A transmitter eraser, comprising:  
an erasing pad having a diameter;  
10      a piezoelectric transducer located near said erasing pad, said piezoelectric transducer having a piezoelectric shell having an outer surface and an inner surface, and having a bottom edge and a top edge, said inner surface defining an inner region, an outer conductive layer on said outer surface of said piezoelectric shell, an inner conductive layer on said inner surface of said piezoelectric shell; and  
15      means for applying a voltage to said inner conductive layer and said outer conductive layer.
- 20      2. The transmitter eraser of Claim 1, further comprising:  
a spool having a bottom edge having a first circumference and a top edge having a second circumference located within said inner region of said piezoelectric shell, said bottom edge generally aligned with said bottom edge of said piezoelectric shell, and said top edge generally aligned with said top edge of said piezoelectric shell.  
25      3. The transmitter eraser of Claim 1, wherein said means for applying a voltage to said inner conductive layer and said outer conductive layer includes means for encoding an effective erasing diameter.  
30      4. The transmitter eraser of Claim 1, wherein said bottom edge of said piezoelectric shell is attached to said bottom edge of said spool.  
35      5. The transmitter eraser of Claim 1, wherein said top edge of said piezoelectric shell is attached to said top edge of said spool.

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- 5           6. The transmitter eraser of Claim 2, wherein said spool further comprises:  
              a central surface between said bottom edge and said top edge having a  
              central circumference less than said first circumference of said bottom edge  
              and said circumference of said top edge.
- 15          7. The transmitter eraser of Claim 1, wherein said piezoelectric shell is a  
              piezoelectric film.
- 20          8. The transmitter eraser of Claim 1, wherein said piezoelectric shell is a  
              cylindrical piezoelectric shell.
- 25          9. The transmitter eraser of Claim 1, wherein said piezoelectric shell is a  
              polygonal piezoelectric shell.
- 30          10. The transmitter eraser of Claim 1, wherein said outer conductive layer is  
               silver.
11. The transmitter eraser of Claim 1, wherein said outer conductive layer is a  
               silver based compound.
12. The transmitter eraser of Claim 1, wherein said outer conductive layer is a  
               silver based alloy.
13. The transmitter eraser of Claim 1, wherein said outer conductive layer is a  
               mixture of carbon and silver.
14. The transmitter eraser of Claim 1, wherein said inner conductive layer is  
               silver.
15. The transmitter eraser of Claim 1, wherein said inner conductive layer is a  
               silver based compound.

16. The transmitter eraser of Claim 1, wherein said inner conductive layer is a silver based alloy.
- 5 17. The transmitter eraser of Claim 1, wherein said inner conductive layer is a mixture of carbon and silver.
- 10 18. The transmitter eraser of Claim 1, wherein said piezoelectric shell includes a first lead extension tab and a second lead extension tab on said bottom edge of said piezoelectric shell, wherein said outer conductive layer extends onto said first lead extension tab, and said inner conductive layer extends onto said second lead extension tab.
- 15 19. A transmitter pen, comprising:  
an transmitter pen enclosure having a writing end and an access end opposite said writing end, an a writing pen cavity defined within said transmitter pen enclosure from said access end through said writing end;
- 20 a plurality of piezoelectric ceramic transducers having an inner surface and an inner surface located around said writing end of said transmitter pen enclosure, wherein said outer surfaces of each of said plurality of piezoelectric ceramic transducers face outward from said writing end of said transmitter pen enclosure; and
- 25 means for applying a voltage to said inner surface and said outer surface of each of said plurality of piezoelectric ceramic transducers.
20. The transmitter pen of Claim 19, further comprising:  
30 a plurality of second output transducers located circumferentially around said writing end of said transmitter pen enclosure, wherein said second output transducers face outward from said writing end of said transmitter pen enclosure; and

means for applying a voltage to each of said plurality of second output transducers.

21. A data entry device, comprising:

5 an enclosure having a writing end and an erasing end opposite said writing end, and a writing pen cavity defined within said enclosure and extending through said writing end;

10 an erasing pad located on said erasing end of said enclosure;

15 at least one piezoelectric writing transducer located at said writing end of said enclosure;

20 at least one piezoelectric erasing transducer located at said erasing end of said enclosure;

25 means for applying a voltage to said piezoelectric writing transducer; and

30 means for applying a voltage to said piezoelectric erasing transducer.

22. The data entry device of Claim 21, further comprising:

35 a plurality of second output writing transducers located circumferentially around said writing end of said enclosure, wherein said second output transducers face outward from said writing end of said enclosure; and

30 means for applying a voltage to each of said plurality of second output writing transducers.

23. The transmitter eraser of Claim 22, wherein said plurality of second output writing transducers are infrared transducers.

- 35 24. The data entry device of Claim 21, further comprising:

a plurality of second output erasing transducers located circumferentially around said erasing end of enclosure, wherein said second output transducers face outward from said erasing end of said enclosure; and

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means for applying a voltage to each of said plurality of second output erasing transducers.

25. The transmitter eraser of Claim 24, wherein said plurality of second output erasing transducers are infrared transducers.